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NEWS	1		Web Page for STN Seminar Schedule - N. America
NEWS	2	JAN 02	STN pricing information for 2008 now available
NEWS	3	JAN 16	CAS patent coverage enhanced to include exemplified prophetic substances
NEWS	4	JAN 28	USPATFULL, USPAT2, and USPATOLD enhanced with new custom IPC display formats
NEWS	5	JAN 28	MARPAT searching enhanced
NEWS	6	JAN 28	USGENE now provides USPTO sequence data within 3 days of publication
NEWS	7	JAN 28	TOXCENTER enhanced with reloaded MEDLINE segment
NEWS	8	JAN 28	MEDLINE and LMEDLINE reloaded with enhancements
NEWS	9	FEB 08	STN Express, Version 8.3, now available
NEWS	10	FEB 20	PCI now available as a replacement to DPCI
NEWS	11	FEB 25	IFIREF reloaded with enhancements
NEWS	12	FEB 25	IMSPRODUCT reloaded with enhancements
NEWS	13	FEB 29	WPINDEX/WPIDS/WPIX enhanced with ECLA and current U.S. National Patent Classification
NEWS	14	MAR 31	IFICDB, IFIPAT, and IFIUIDB enhanced with new custom IPC display formats
NEWS	15	MAR 31	CAS REGISTRY enhanced with additional experimental spectra
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NEWS	18	MAR 31	EMBASE, EMBAL, and LEMBASE reloaded with enhancements
NEWS	19	APR 04	STN AnaVist, Version 1, to be discontinued
NEWS	20	APR 15	WPIDS, WPINDEX, and WPIX enhanced with new predefined hit display formats
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NEWS	22	APR 28	IMSRESEARCH reloaded with enhancements
NEWS	23	MAY 30	INPAFAMDB now available on STN for patent family searching
NEWS	24	MAY 30	DGENE, PCTGEN, and USGENE enhanced with new homology sequence search option
NEWS	25	JUN 06	EPFULL enhanced with 260,000 English abstracts
NEWS	26	JUN 06	KOREAPAT updated with 41,000 documents
NEWS	27	JUN 13	USPATFULL and USPAT2 updated with 11-character patent numbers for U.S. applications
NEWS	28	JUN 19	CAS REGISTRY includes selected substances from web-based collections
NEWS	29	JUN 25	CA/CAPLUS and USPAT databases updated with IPC reclassification data
NEWS	30	JUN 30	AEROSPACE enhanced with more than 1 million U.S. patent records
NEWS	31	JUN 30	EMBASE, EMBAL, and LEMBASE updated with additional options to display authors and affiliated

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organizations
NEWS 32 JUN 30 STN on the Web enhanced with new STN AnaVist
Assistant and BLAST plug-in
NEWS 33 JUN 30 STN AnaVist enhanced with database content from EPFULL

NEWS EXPRESS JUNE 27 08 CURRENT WINDOWS VERSION IS V8.3,
AND CURRENT DISCOVER FILE IS DATED 23 JUNE 2008.

NEWS HOURS STN Operating Hours Plus Help Desk Availability
NEWS LOGIN Welcome Banner and News Items
NEWS IPC8 For general information regarding STN implementation of IPC 8

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Enter NEWS followed by the item number or name to see news on that specific topic.

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\* \* \* \* \* STN Columbus \* \* \* \* \*

FILE 'HOME' ENTERED AT 13:15:36 ON 03 JUL 2008

=> index bioscience medicine

FILE 'DRUGMONOG' ACCESS NOT AUTHORIZED

COST IN U.S. DOLLARS

SINCE FILE	TOTAL
ENTRY	SESSION
0.63	0.63

FULL ESTIMATED COST

INDEX 'ADISCTI, ADISINSIGHT, ADISNEWS, AGRICOLA, ANABSTR, ANTE, AQUALINE, AQUASCI, BIOENG, BIOSIS, BIOTECHABS, BIOTECHDS, BIOTECHNO, CABA, CAPLUS, CEABA-VTB, CIN, CONFSCI, CROPB, CROPU, DDFB, DDFU, DGENE, DISSABS, DRUGB, DRUGMONOG2, DRUGU, EMBAL, EMBASE, ...' ENTERED AT 13:17:18 ON 03 JUL 2008

72 FILES IN THE FILE LIST IN STNINDEX

Enter SET DETAIL ON to see search term postings or to view search error messages that display as 0\* with SET DETAIL OFF.

=> s nitril?(s)hydratas?

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L1 QUE NITRIL?(S) HYDRATAS?

=> d rank

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F37	3	EMBAL
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F39	2	FROSTI
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F41	1	DRUGU
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=> file f3-f14

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	5.20	5.83

FILE 'CAPLUS' ENTERED AT 13:21:57 ON 03 JUL 2008  
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=> s nitril?(s)hydratas?  
 L2 5018 NITRIL?(S) HYDRATAS?

=> s l2(s) (bacter? or microb? or prokar? or thermophil?)  
 9 FILES SEARCHED...  
 L3 1365 L2(S) (BACTER? OR MICROB? OR PROKAR? OR THERMOPHIL?)

```
=> s l3(s) (modif? or muta? or modif? or substit? or repla? or recomb?)
    9 FILES SEARCHED...
L4      442 L3(S) (MODIF? OR MUTA? OR MODIF? OR SUBSTIT? OR REPLA? OR RECOMB
          IN?)
```

```
=> s l4(s)thermophila?
L5      256 L4(S) THERMOPHILA?
```

```
=> dup rem l5
DUPLICATE IS NOT AVAILABLE IN 'USGENE'.
ANSWERS FROM THESE FILES WILL BE CONSIDERED UNIQUE
PROCESSING COMPLETED FOR L5
L6          248 DUP REM L5 (8 DUPLICATES REMOVED)
```

```
=> s 15 and (position(s) (36## or 71## or 148## or 204## or 10## or 32## or 37## or
41## or 46## or 48## or 51## or 72## or 118## or 127## or 146## or 160## or 186##
or 217## or 108## or 212## or 6## or 19## or 126##))
TERM '6##' EXCEEDED TRUNCATION LIMITS - SEARCH ENDED
You have entered a truncated stem which occurs in too many terms.
Make the stem longer and try again. For example, if your original
term was 'degr?' to search for variations and the abbreviation for
'degradation', you could replace it with the expression '(degrdn OR
degrad?)'. If your search term was numeric, e.g., 'C>5', reduce the
size of the range.
```

```
=> s l5 and (position(s) (36## or 71## or 148## or 204## or 10## or 32## or 37## or
41## or 46## or 48## or 51## or 72## or 118## or 127## or 146## or 160## or 186##
or 217## or 108## or 212## or 19## or 126##))
TERM '10##' EXCEEDED TRUNCATION LIMITS - SEARCH ENDED
You have entered a truncated stem which occurs in too many terms.
Make the stem longer and try again. For example, if your original
term was 'degr?' to search for variations and the abbreviation for
'degradation', you could replace it with the expression '(degrdn OR
degrad?)'. If your search term was numeric, e.g., 'C>5', reduce the
size of the range.
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```
=> s l5 and (position(s) (36th or 71st or 148th or 204th or 10th or 32nd or 37th or
41st or 46th or 48th or 51st or 72nd or 118th or 127th or 146th or 160th or 186th
or 217th or 108th or 212nd or 19th or 126th))
  9 FILES SEARCHED...
L7      2 L5 AND (POSITION(S) (36TH OR 71ST OR 148TH OR 204TH OR 10TH OR
32ND OR 37TH OR 41ST OR 46TH OR 48TH OR 51ST OR 72ND OR 118TH
OR 127TH OR 146TH OR 160TH OR 186TH OR 217TH OR 108TH OR 212ND
OR 19TH OR 126TH))
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=> s l5 and (position(s) (36 or 71 or 148 or 204 or 10 or 32 or 37 or 41 or 46 or 48
or 51 or 72 or 118 or 127 or 146 or 160 or 186 or 217 or 108 or 212 or 19 or 126))
6 FILES SEARCHED...
L8          4 L5 AND (POSITION(S) (36 OR 71 OR 148 OR 204 OR 10 OR 32 OR 37
OR 41 OR 46 OR 48 OR 51 OR 72 OR 118 OR 127 OR 146 OR 160 OR
186 OR 217 OR 108 OR 212 OR 19 OR 126))
```

=> d ibib abs 17 1-2

L7 ANSWER 1 OF 2 USPATFULL on STN  
ACCESSION NUMBER: 1999:65189 USPATFULL  
TITLE: Nitrile hydratase  
INVENTOR(S): Ito, Kiyoshi, Mobara, Japan  
Yamaki, Toshifumi, Mobara, Japan  
Arii, Teruo, Chiba, Japan  
Tsuruoka, Miyuki, Yachimata, Japan

PATENT ASSIGNEE(S): Nakamura, Takeshi, Ichihara, Japan  
Mitsui Chemicals, Inc., Tokyo, Japan (non-U.S.  
corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5910432		19990608
APPLICATION INFO.:	US 1997-990818		19971215 (8)
RELATED APPLN. INFO.:	Division of Ser. No. US 1997-800751, filed on 14 Feb 1997, now patented, Pat. No. US 5807730		

	NUMBER	DATE
PRIORITY INFORMATION:	JP 1996-27004	19960214
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	Granted	
PRIMARY EXAMINER:	Wax, Robert A.	
ASSISTANT EXAMINER:	Bugaisky, Gabriele E.	
LEGAL REPRESENTATIVE:	Burns, Doane, Swecker & Mathis, L.L.P.	
NUMBER OF CLAIMS:	25	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	2 Drawing Figure(s); 2 Drawing Page(s)	
LINE COUNT:	4325	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The present invention provides the amino acid sequence and base sequence of a Pseudonocardia thermophila-derived nitrile hydratase, provides further a method for changing its amino acid sequence and base sequence without substantially changing the functions of said nitrile hydratase, and nitrile hydratases having a base sequence and an amino acid sequence as changed on the basis of said method, and provides furthermore a recombinant plasmid having the gene of said nitrile hydratase, a transformant containing said recombinant plasmid, a method of using said transformant for producing said enzyme, and a method of using said transformant for producing the corresponding amide compound from a nitrile compound.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 2 OF 2 USPATFULL on STN

ACCESSION NUMBER: 1998:111815 USPATFULL  
TITLE: Nitrile hydratase  
INVENTOR(S): Ito, Kiyoshi, Mobara, Japan  
Yamaki, Toshifumi, Mobara, Japan  
Arii, Teruo, Chiba, Japan  
Tsuruoka, Miyuki, Yachimata, Japan  
Nakamura, Takeshi, Ichihara, Japan  
PATENT ASSIGNEE(S): Mitsui Chemicals, Inc., Tokyo, Japan (non-U.S.  
corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5807730		19980915
APPLICATION INFO.:	US 1997-800751		19970214 (8)

	NUMBER	DATE
PRIORITY INFORMATION:	JP 1996-27004	19960214
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	Granted	
PRIMARY EXAMINER:	Wax, Robert A.	
ASSISTANT EXAMINER:	Bugaisky, Gabriele E.	

LEGAL REPRESENTATIVE: Burns, Doane, Swecker & Mathis, L.L.P.  
NUMBER OF CLAIMS: 4  
EXEMPLARY CLAIM: 1  
NUMBER OF DRAWINGS: 2 Drawing Figure(s); 2 Drawing Page(s)  
LINE COUNT: 4086

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The present invention provides the amino acid sequence and base sequence of a Pseudonocardia thermophila-derived nitrile hydratase, provides further a method for changing its amino acid sequence and base sequence without substantially changing the functions of said nitrile hydratase, and nitrile hydratases having a base sequence and an amino acid sequence as changed on the basis of said method, and provides furthermore a recombinant plasmid having the gene of said nitrile hydratase, a transformant containing said recombinant plasmid, a method of using said transformant for producing said enzyme, and a method of using said transformant for producing the corresponding amide compound from a nitrile compound.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

=> d ibib abs l8 1-4

L8 ANSWER 1 OF 4 USPATEFULL on STN

ACCESSION NUMBER: 2007:11574 USPATEFULL  
TITLE: Novel nitrile hydratase  
INVENTOR(S): Yamaki, Toshifumi, Mobara-shi, JAPAN  
Banba, Shinichi, Mobara-shi, JAPAN  
Matoishi, Kaori, Mobara-shi, JAPAN  
Ito, Kiyoshi, Sodegaura-shi, JAPAN  
Kobayashi, Hideki, Mobara-shi, JAPAN  
Tanaka, Eishi, Sodegaura-shi, JAPAN  
Oikawa, Toshihiro, Mobara-shi, JAPAN  
PATENT ASSIGNEE(S): Mitsui Chemicals, Inc., Minato-ku, JAPAN, 105-7117  
(non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 20070009985	A1	20070111
APPLICATION INFO.:	US 2003-539560	A1	20031215 (10)
	WO 2003-JP16014		20031215
			20050617 PCT 371 date

	NUMBER	DATE
PRIORITY INFORMATION:	JP 2002-368360	20021219
	JP 2003-379280	20031110
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	BUCHANAN, INGERSOLL & ROONEY PC, POST OFFICE BOX 1404, ALEXANDRIA, VA, 22313-1404, US	
NUMBER OF CLAIMS:	77	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	2 Drawing Page(s)	
LINE COUNT:	12017	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The amino acid sequence of a mutant which is obtained by introducing a novel mutation into a Pseudonocardia thermophila JCM3095-derived nitrile hydratase consisting of two types of heterogeneous subunits, and the base sequence of the gene are provided. The nitrile hydratase is

modified by specifying the region to be modified in the stereostructure/amino acid sequence of the nitrile hydratase, and applying alteration such as substitution, insertion, deletion or the like, to the amino acids in the amino acid sequence which are corresponding to the amino acid residues forming the region. Also provided is a method for modifying an enzyme having a nitrile hydratase activity.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 2 OF 4 USPATFULL on STN

ACCESSION NUMBER: 1999:65189 USPATFULL  
TITLE: Nitrile hydratase  
INVENTOR(S): Ito, Kiyoshi, Mobara, Japan  
Yamaki, Toshifumi, Mobara, Japan  
Arii, Teruo, Chiba, Japan  
Tsuruoka, Miyuki, Yachimata, Japan  
Nakamura, Takeshi, Ichihara, Japan  
PATENT ASSIGNEE(S): Mitsui Chemicals, Inc., Tokyo, Japan (non-U.S. corporation)

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DOCUMENT TYPE:	Utility	
FILE SEGMENT:	Granted	
PRIMARY EXAMINER:	Wax, Robert A.	
ASSISTANT EXAMINER:	Bugaisky, Gabriele E.	
LEGAL REPRESENTATIVE:	Burns, Doane, Swecker & Mathis, L.L.P.	
NUMBER OF CLAIMS:	25	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	2 Drawing Figure(s); 2 Drawing Page(s)	
LINE COUNT:	4325	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The present invention provides the amino acid sequence and base sequence of a Pseudonocardia thermophila-derived nitrile hydratase, provides further a method for changing its amino acid sequence and base sequence without substantially changing the functions of said nitrile hydratase, and nitrile hydratases having a base sequence and an amino acid sequence as changed on the basis of said method, and provides furthermore a recombinant plasmid having the gene of said nitrile hydratase, a transformant containing said recombinant plasmid, a method of using said transformant for producing said enzyme, and a method of using said transformant for producing the corresponding amide compound from a nitrile compound.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 3 OF 4 USPATFULL on STN

ACCESSION NUMBER: 1998:111815 USPATFULL  
TITLE: Nitrile hydratase  
INVENTOR(S): Ito, Kiyoshi, Mobara, Japan  
Yamaki, Toshifumi, Mobara, Japan  
Arii, Teruo, Chiba, Japan



PATENT ASSIGNEE(S): Tsuruoka, Miyuki, Yachimata, Japan  
Nakamura, Takeshi, Ichihara, Japan  
Mitsui Chemicals, Inc., Tokyo, Japan (non-U.S.  
corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5807730		19980915
APPLICATION INFO.:	US 1997-800751		19970214 (8)

	NUMBER	DATE
PRIORITY INFORMATION:	JP 1996-27004	19960214
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	Granted	
PRIMARY EXAMINER:	Wax, Robert A.	
ASSISTANT EXAMINER:	Bugaisky, Gabriele E.	
LEGAL REPRESENTATIVE:	Burns, Doane, Swecker & Mathis, L.L.P.	
NUMBER OF CLAIMS:	4	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	2 Drawing Figure(s); 2 Drawing Page(s)	
LINE COUNT:	4086	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The present invention provides the amino acid sequence and base sequence of a Pseudonocardia thermophila-derived nitrile hydratase, provides further a method for changing its amino acid sequence and base sequence without substantially changing the functions of said nitrile hydratase, and nitrile hydratases having a base sequence and an amino acid sequence as changed on the basis of said method, and provides furthermore a recombinant plasmid having the gene of said nitrile hydratase, a transformant containing said recombinant plasmid, a method of using said transformant for producing said enzyme, and a method of using said transformant for producing the corresponding amide compound from a nitrile compound.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 4 OF 4 BIOTECHDS COPYRIGHT 2008 THOMSON REUTERS on STN

ACCESSION NUMBER: 2004-23874 BIOTECHDS

TITLE: Novel cobalt type nitrile hydratase containing subunit coupled with cobalt atom through specific amino acid sequence, useful for producing amide compound; recombinant enzyme production and vector expression in host cell for use in amide compound production

PATENT ASSIGNEE: MITSUI CHEM INC

PATENT INFO: JP 2004261105 24 Sep 2004

APPLICATION INFO: JP 2003-55481 3 Mar 2003

PRIORITY INFO: JP 2003-55481 3 Mar 2003; JP 2003-55481 3 Mar 2003

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

OTHER SOURCE: WPI: 2004-672173 [66]

AN 2004-23874 BIOTECHDS

AB DERWENT ABSTRACT:

NOVELTY - A cobalt type nitrile hydratase (I) containing a subunit coupled with cobalt atom through a specific amino acid sequence, as a component, is new.

DETAILED DESCRIPTION - A cobalt type nitrile hydratase (I) contains a subunit coupled with cobalt atom through an amino acid sequence such as Cys-Ser-Leu-Csi-Ser-Cse, as a component, where Csi represents cysteine sulfinic acid and Cse represents cysteine sulfenic acid. An INDEPENDENT CLAIM is also included for a transformed

strain (II) comprising (I), the culture solution of the strain, or its treated substance.

BIOTECHNOLOGY - Preferred Hydratase: (I) comprises an alpha subunit derived from Pseudonocardia thermophila. The cobalt atom binding domain in alpha subunit (ST1) of (I) comprises a sequence of Cys-Thr-Leu-Csi-Ser-Cse, where the Thr residue is substituted by a Ser residue, such that ST1 binds with cobalt atom through a region having a sequence of Cys-Ser-Leu-Csi-Ser-Cse, where ST1 comprises a fully defined sequence of 205 amino acids (S1) as given in the specification or an amino acid sequence comprising (S1) in which one or more amino acids are deleted, substituted or added excluding sequences from position 108-113 of (S1).

(I) comprises ST1 and a subunit (ST2) comprising a fully defined sequence of 233 amino acids (S2) as given in the specification, or a sequence comprising (S2) in which one or more amino acids are deleted, substituted or added.

USE - (I) or (II) is useful for producing amide compound, which involves contacting (I) or (II), the culture solution of (II) or its treated substance with nitrile compound in an aqueous medium (claimed).

ADVANTAGE - (I) enables production of amide compound (claimed).

EXAMPLE - Strain MT-10822 was inoculated into a LB culture medium, cultivated at 37 degreesC for 20 hours, centrifuged for 5 minutes and a plasmid pPT-DB1 was prepared from the DNA of the microbial cells. The plasmid pPT-DB1 was taken as a template and PCR was performed twice using the sequences such as 5'-gcaggagcagagcgagcaca-3' and 5'-caggaaacagctatgac-3', and 5'-ggccagtgcctagcttacat-3' and 5'-gttttcccagtcacgac-3'. The products obtained by the PCR were annealed at 37 degreesC, amplified by PCR using the primers having sequences such as 5'-caggaaacagctatgac-3' and 5'-gttttcccagtcacgac-3', and the amplified DNA fragment obtained by the process was subjected to restriction enzyme digestion using EcoRI and HindIII. The pPT-DB1 prepared by the above mentioned process was subjected to restriction enzyme digestion using EcoRI and HindIII, ligated with the amplified fragment, and introduced into Escherichia coli HB101 strain. The transformed organism was cultivated in LB medium containing ferric sulfate heptahydrate (40 microg/ml) and cobalt chloride dihydrate (10 microg/ml) at 37 degreesC for 20 hours. The microbial cells were crushed by ultrasonic crusher, and an enzyme extract having nitrile hydratase activity was obtained. (19 pages)

=> d his full

(FILE 'HOME' ENTERED AT 13:15:36 ON 03 JUL 2008)

INDEX 'ADISCTI, ADISINSIGHT, ADISNEWS, AGRICOLA, ANABSTR, ANTE, AQUALINE, AQUASCI, BIOENG, BIOSIS, BIOTECHABS, BIOTECHDS, BIOTECHNO, CABA, CAPLUS, CEABA-VTB, CIN, CONFSCI, CROPB, CROPU, DDFB, DDFU, DGENE, DISSABS, DRUGB, DRUGMONOG2, DRUGU, EMBAL, EMBASE, ...' ENTERED AT 13:17:18 ON 03 JUL 2008  
SEA NITRIL?(S)HYDRATAS?

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47 FILE AGRICOLA  
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 6 FILE CIN  
 19 FILE CONFSCI  
 3 FILE CROPU  
 1193 FILE DGENE  
 24 FILE DISSABS  
 1 FILE DRUGU  
 3 FILE EMBAL  
 280 FILE EMBASE  
 209 FILE ESBIODBASE  
 2 FILE FROSTI  
 5 FILE FSTA  
 1871 FILE GENBANK  
 163 FILE IFIPAT  
 212 FILE LIFESCI  
 252 FILE MEDLINE  
 1 FILE NTIS  
 248 FILE PASCAL  
 36 FILE PCTGEN  
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 136 FILE TOXCENTER  
 892 FILE USGENE  
 443 FILE USPATFULL  
 82 FILE USPAT2  
 2 FILE WATER  
 208 FILE WPIDS  
 6 FILE WPIFV  
 208 FILE WPINDEX  
 8 FILE NLDB

L1 QUE NITRIL?(S) HYDRATAS?

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 D RANK

FILE 'CAPLUS, USGENE, SCISEARCH, USPATFULL, BIOSIS, BIOTECHDS, EMBASE,  
 MEDLINE, PASCAL, LIFESCI, ESBIODBASE' ENTERED AT 13:21:57 ON 03 JUL 2008

L2 5018 SEA NITRIL?(S) HYDRATAS?  
 L3 1365 SEA L2(S) (BACTER? OR MICROB? OR PROKAR? OR THERMOPHIL?)  
 L4 442 SEA L3(S) (MODIF? OR MUTA? OR MODIF? OR SUBSTIT? OR REPLA? OR  
 RECOMBIN?)  
 L5 256 SEA L4(S) THERMOPHILA?  
 L6 248 DUP REM L5 (8 DUPLICATES REMOVED)  
 L7 2 SEA L5 AND (POSITION(S) (36TH OR 71ST OR 148TH OR 204TH OR 10TH  
 OR 32ND OR 37TH OR 41ST OR 46TH OR 48TH OR 51ST OR 72ND OR  
 118TH OR 127TH OR 146TH OR 160TH OR 186TH OR 217TH OR 108TH OR  
 212ND OR 19TH OR 126TH))  
 L8 4 SEA L5 AND (POSITION(S) (36 OR 71 OR 148 OR 204 OR 10 OR 32 OR  
 37 OR 41 OR 46 OR 48 OR 51 OR 72 OR 118 OR 127 OR 146 OR 160  
 OR 186 OR 217 OR 108 OR 212 OR 19 OR 126))  
 D IBIB ABS L7 1-2  
 D IBIB ABS L8 1-4

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